# CHAPTER 2

## DESCRIPTION OF THE BUFFALO RIVER WATERSHED



**2.1. BACKGROUND.** The Buffalo River and Watershed are named for the buffalo fish, which were abundant in the Buffalo River when the first settlers arrived. The many river outfitters servicing the river attest to its value as a recreational river in middle Tennessee. Part of the Buffalo River is included in the State Scenic River System due to its pastoral nature.

This Chapter describes the location and characteristics of the Buffalo River Watershed.

## 2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Buffalo River Watershed is located in Middle Tennessee and includes parts of Hickman, Humphreys, Lawrence, Lewis, Perry, and Wayne Counties.

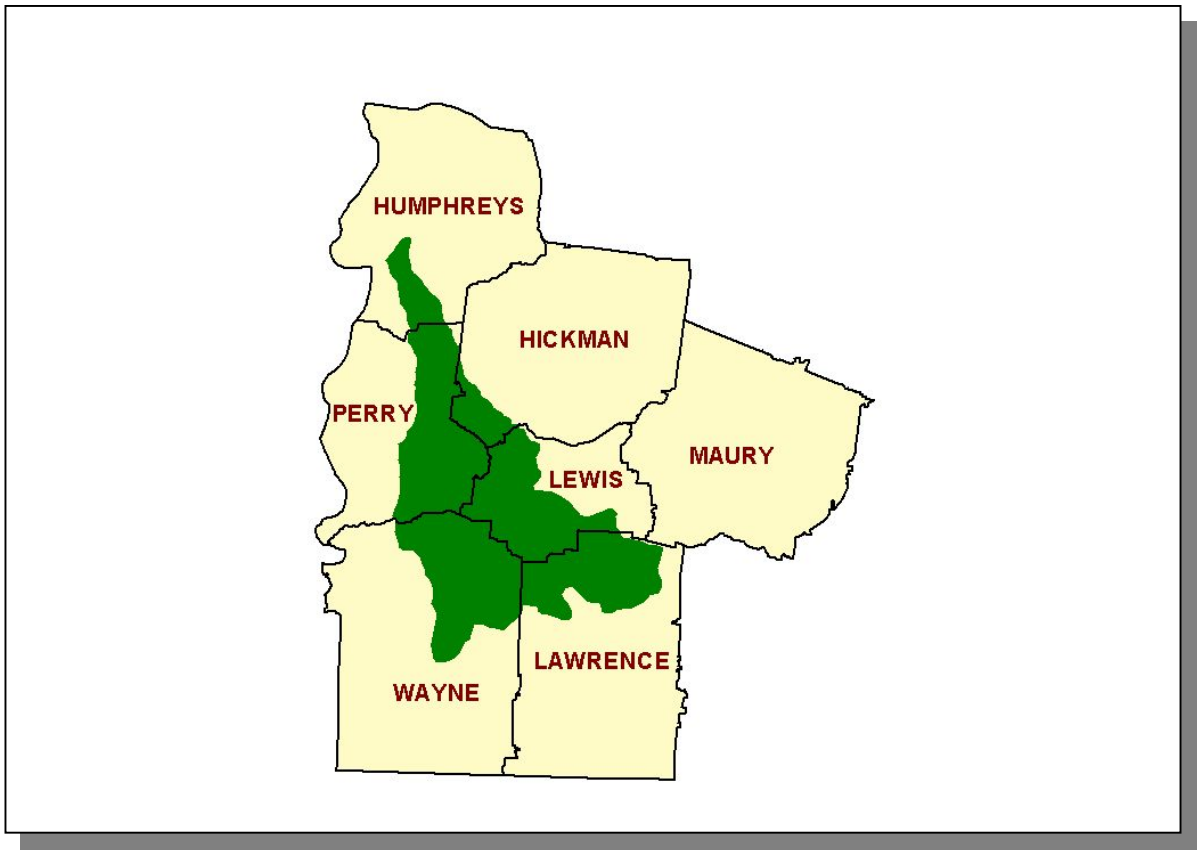


*Figure 2-1. General Location of the Buffalo River Watershed.*

| COUNTY | % OF WATERSHED IN EACH COUNTY |
|---|---|
| Perry | 25.1 |
| Wayne | 25.1 |
| Lawrence | 19.6 |
| Lewis | 19.5 |
| Hickman | 5.4 |
| Humphreys | 5.4 |

*Table 2-1. The Buffalo River Watershed Includes Parts of Six Middle Tennessee Counties.*

2.2.B. Population Density Centers. Six state highways and one interstate serve the major communities in the Buffalo River Watershed.

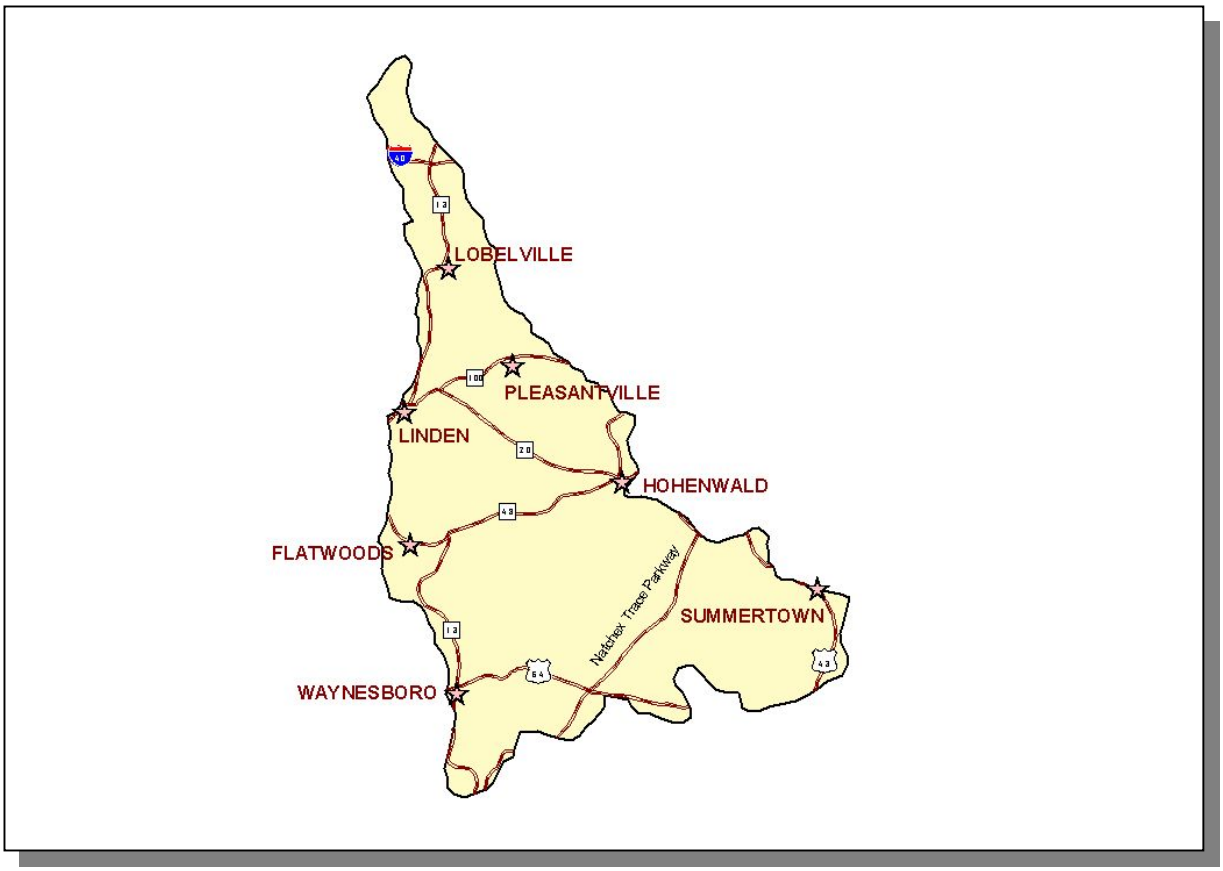


***Figure 2-2. Municipalities and Roads in the Buffalo River Watershed.***

| MUNICIPALITY | POPULATION | COUNTY |
|---|---|---|
| Hohenwald* | 4,672 | Lewis |
| Waynesboro* | 1,950 | Wayne |
| Linden* | 1,071 | Perry |
| Lobelville | 958 | Perry |

***Table 2-2. Communities and Populations in the Buffalo River Watershed.*** *Population based on 1999 census (Tennessee 2001/2002 Blue Book). Asterisk (*) indicates county seat.*

## 2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Buffalo River Watershed, designated 06040004 by the USGS, drains approximately 763 square miles, and empties to the Lower Duck River Watershed (06040003).

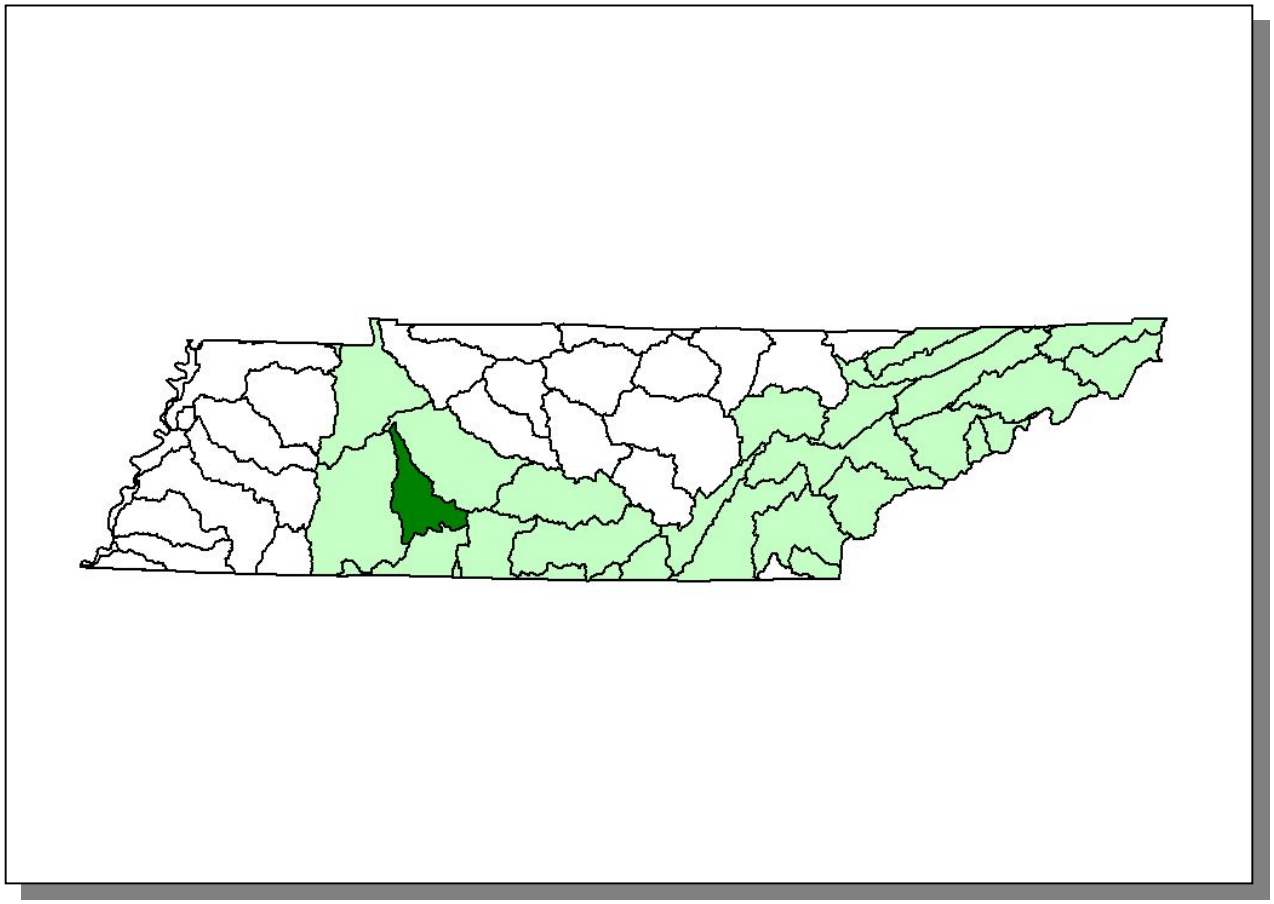

*Figure 2-3. The Buffalo River Watershed is Part of the Tennessee River Basin.*

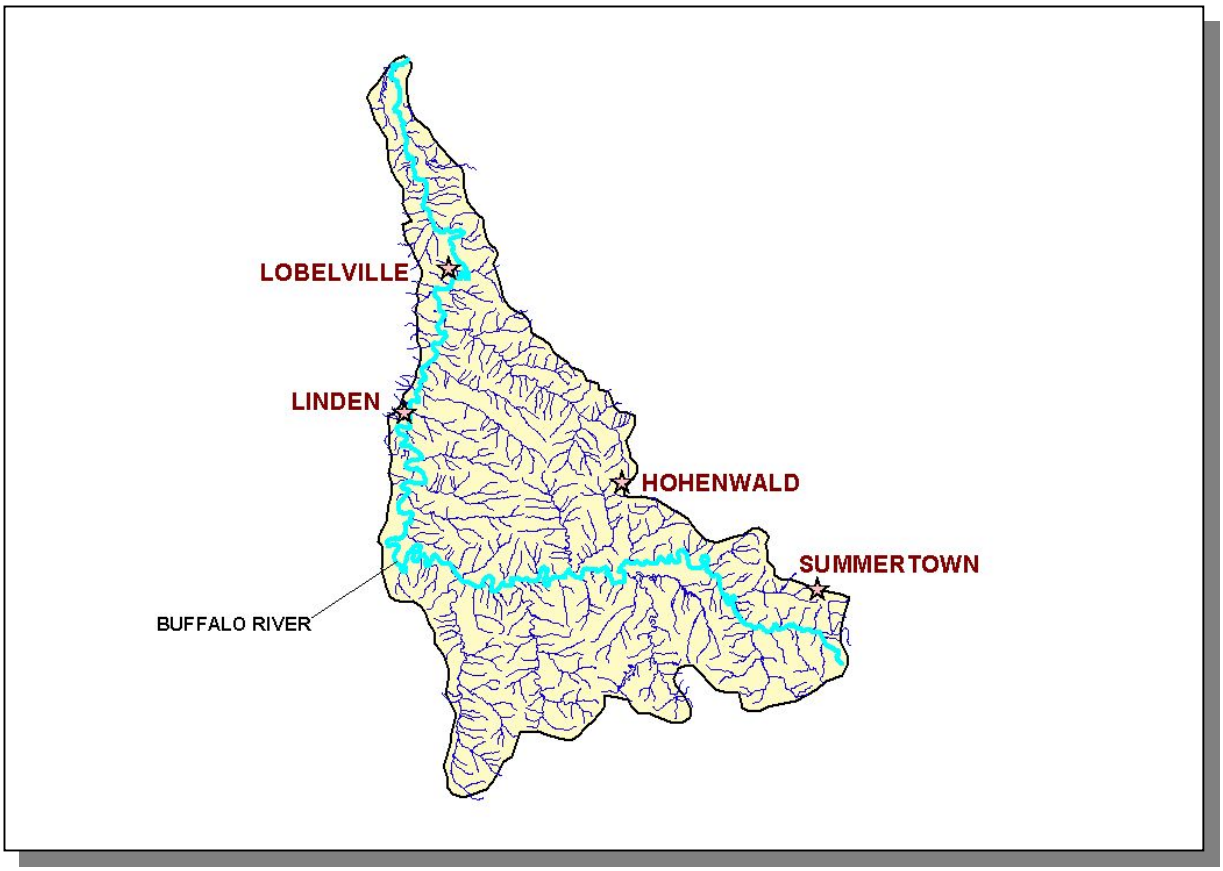


***Figure 2-4. Hydrology in the Buffalo River Watershed.*** *There are 1,200 stream miles and 349 lake acres in the Buffalo River Watershed as catalogued in the assessment database. Location of the Buffalo River and the cities of Hohenwald, Linden, Lobelville, and Summertown are shown for reference.*

2.3.B. Dams. There are 10 dams inventoried by TDEC Division of Water Supply in the Buffalo River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

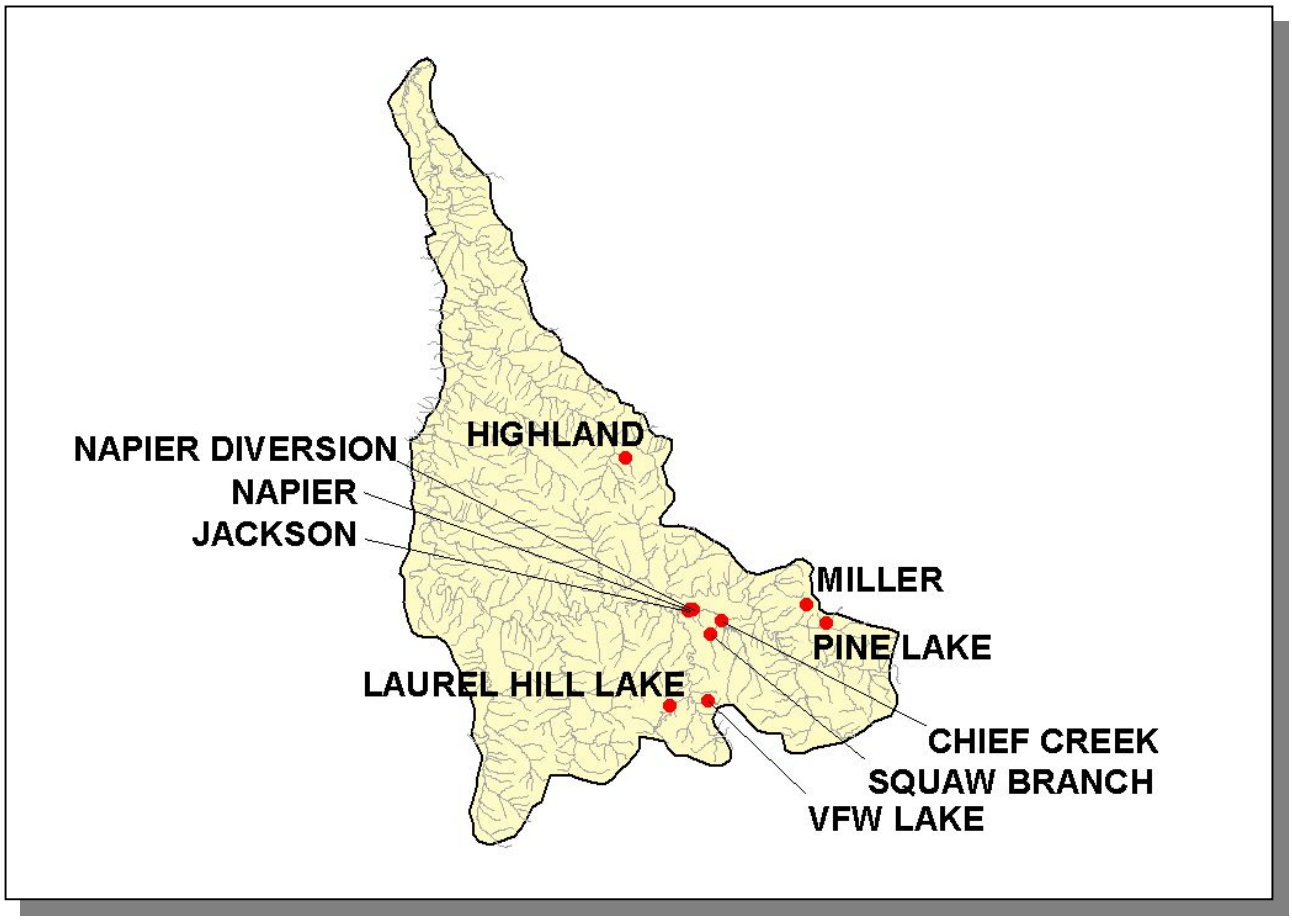


***Figure 2-5. Location of Inventoried Dams in the Buffalo River Watershed.*** *More information is provided in Appendix II and on the TDEC homepage at http://gwidc.memphis.edu/website/dws/.*

**2.4. LAND USE.** Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

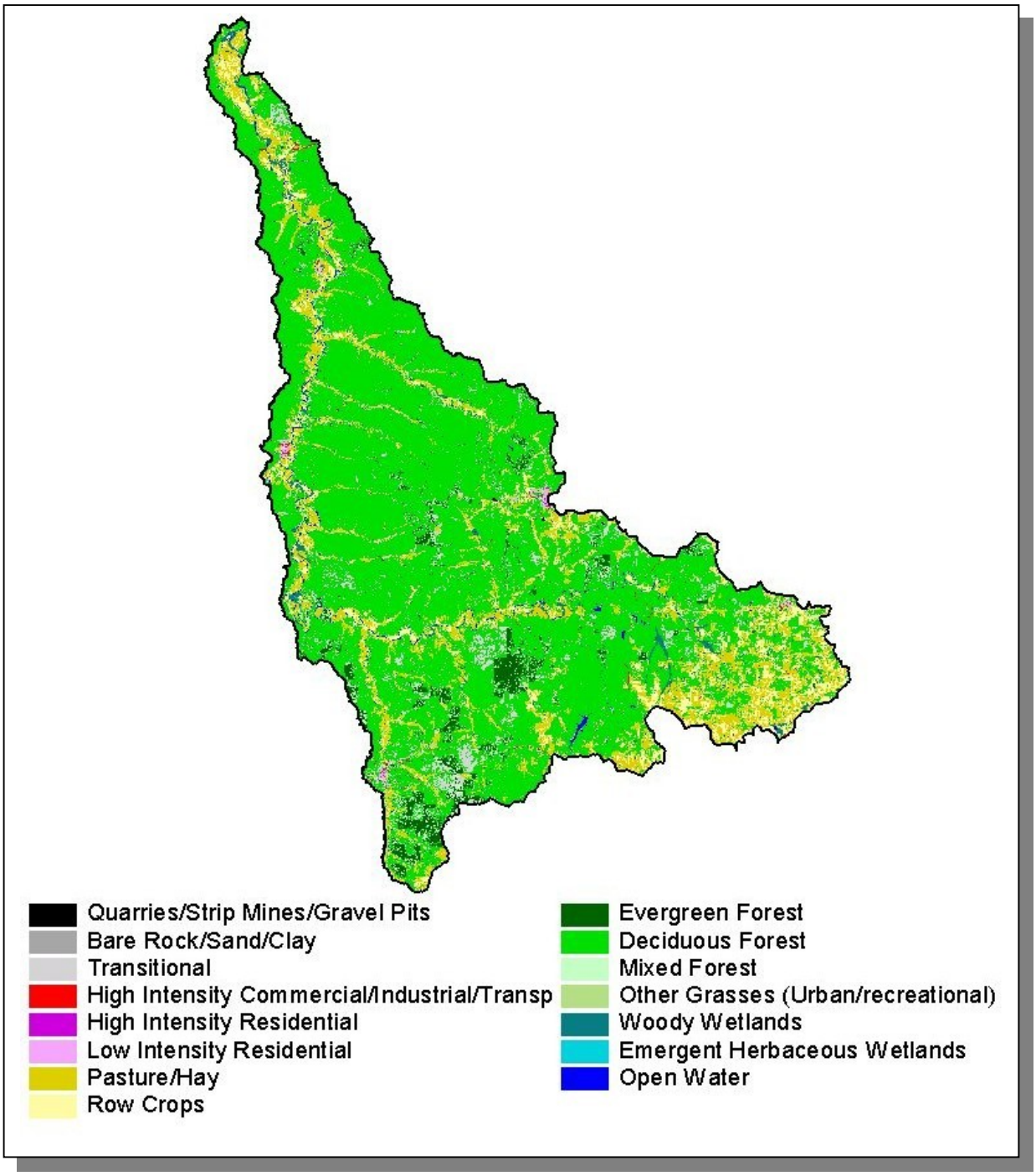


***Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery in the Buffalo River Watershed.***

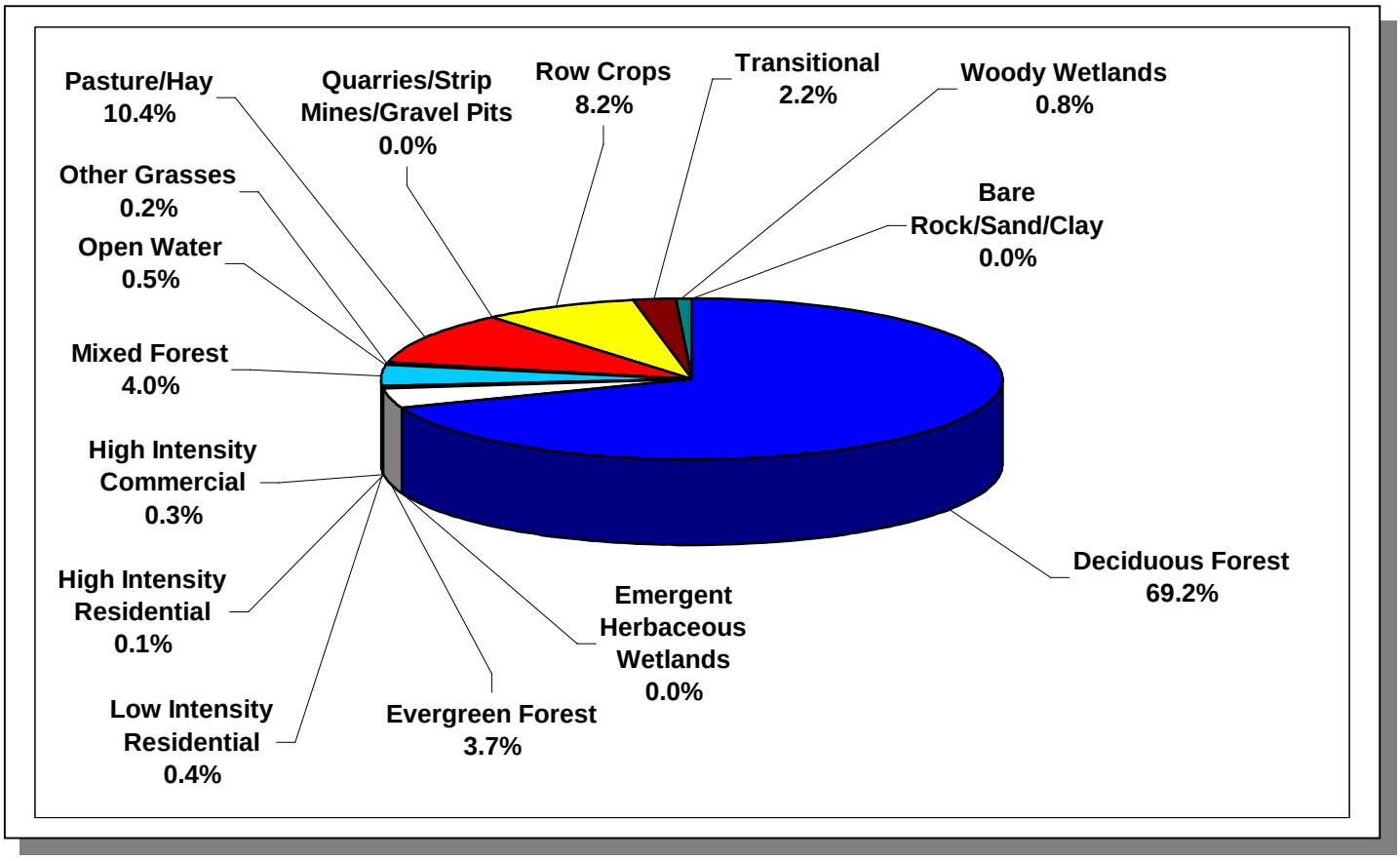


***Figure 2-7. Land Use Distribution in the Buffalo River Watershed.*** *More information is provided in Appendix II.*

Sinkholes, springs, disappearing streams and caves characterize karst topography. The term "karst" describes a distinctive landform that indicates dissolution of underlying soluble rocks by surface water or ground water. Although commonly associated with limestone and dolomite (carbonate rocks), other highly soluble rocks such as gypsum and rock salt can be sculpted into karst terrain. In karst areas, the ground water flows through solution-enlarged channels, bedding planes and microfractures within the rock. The characteristic landforms of karst regions are: closed depressions of various size and arrangement; disrupted surface drainage; and caves and underground drainage systems. The term "karst" is named after a famous region in the former country of Yugoslavia.

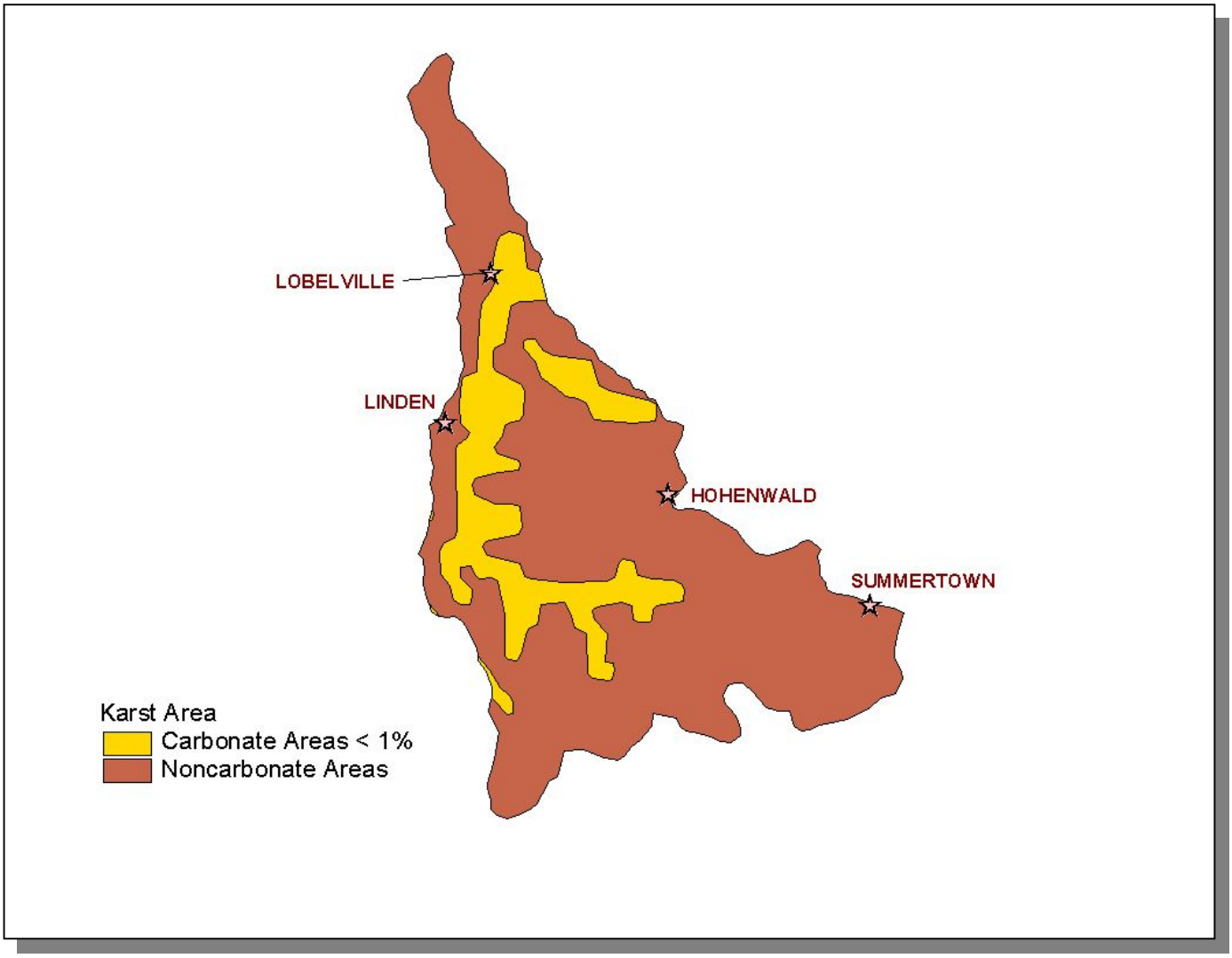


***Figure 2-8. Illustration of Karst Areas in Buffalo River Watershed.*** *Locations of Hohenwald, Linden, Lobelville, and Summertown are shown for reference*

**2.5. ECOREGIONS AND REFERENCE STREAMS.** Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Buffalo River Watershed lies within 2 Level III ecoregions (Southeastern Plains and Interior Plateau) and contains 2 Level IV subecoregions:

- **Transition Hills (65j)** have the highest elevations in Ecoregion 65, and contain characteristics of both the Southeastern Plains (65e) and the Interior Plateau (71). Many streams of this transition area have cut down into the Mississippian, Devonian, and Silurian-age rocks and may appear similar to those of the Interior Plateau (71). Cretaceous-age coastal plain deposits of silt, sand, clay, and gravel overlie the older limestone, shale, and chert. It is a mostly forested region of oak-hickory-pine, and has pine plantation activities associated with pulp and paper operations.

- **Western Highland Rim (71f)** is characterized by dissected, rolling terrain of open hills, with elevations of 400-1000 feet. The geologic base of Mississippian-age limestone, chert, and shale is covered by soils that tend to be cherty and acidic with low to moderate fertility. Streams are relatively clear with a moderate gradient. Substrates are coarse chert, gravel and sand with areas of bedrock. The native oak-hickory forests were removed over broad areas in the mid-to late 1800's in conjunction with the iron-ore related mining and smelting of the mineral limonite, however today the region is again heavily forested. Some agriculture occurs on the flatter interfluves and in the stream and river valleys. The predominant land uses are hay, pasture, and cattle with some cultivation of corn and tobacco.

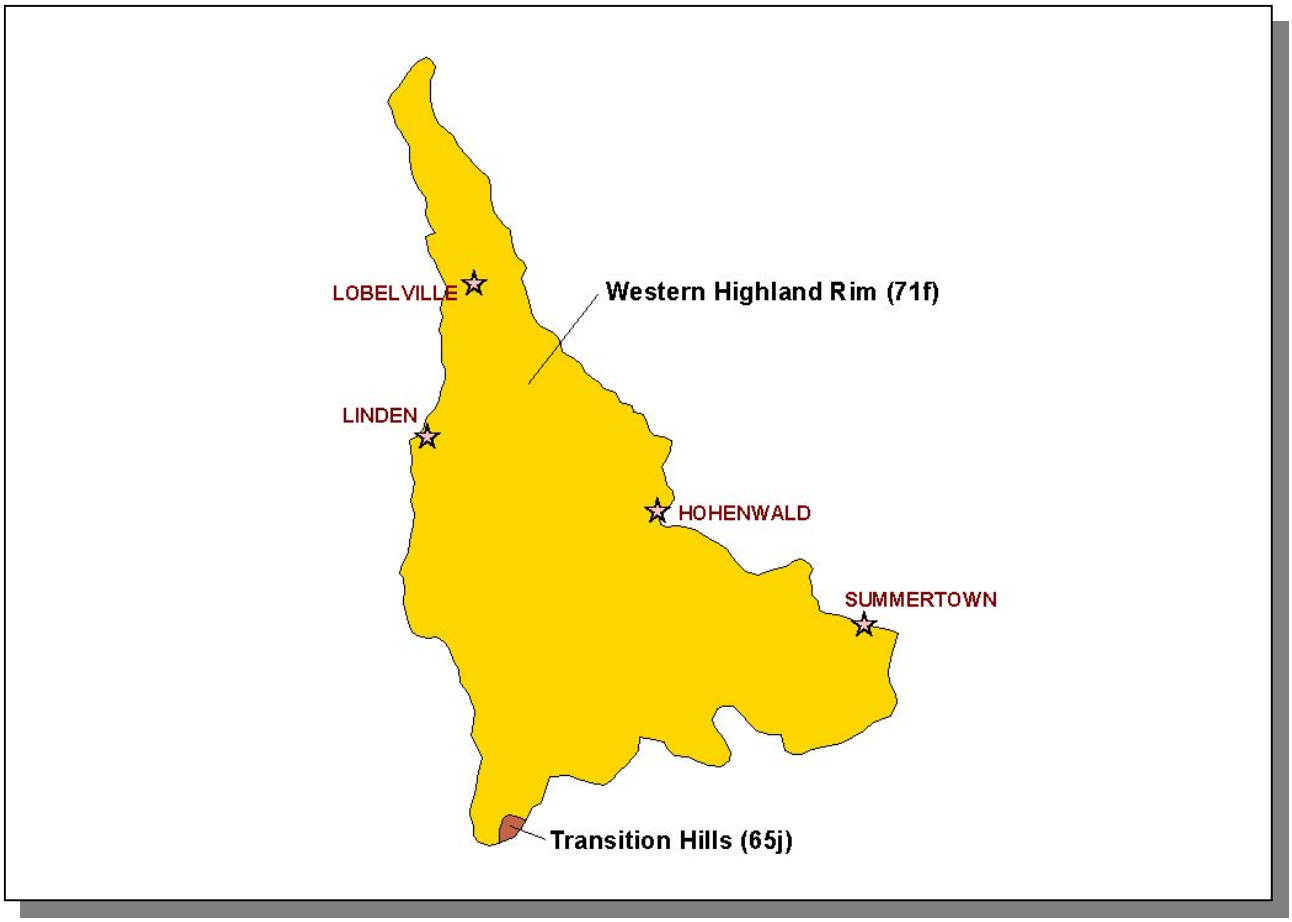


***Figure 2-9. Level IV Ecoregions in the Buffalo River Watershed.*** *Locations of Hohenwald, Linden, Lobelville, and Summertown are shown for reference.*

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

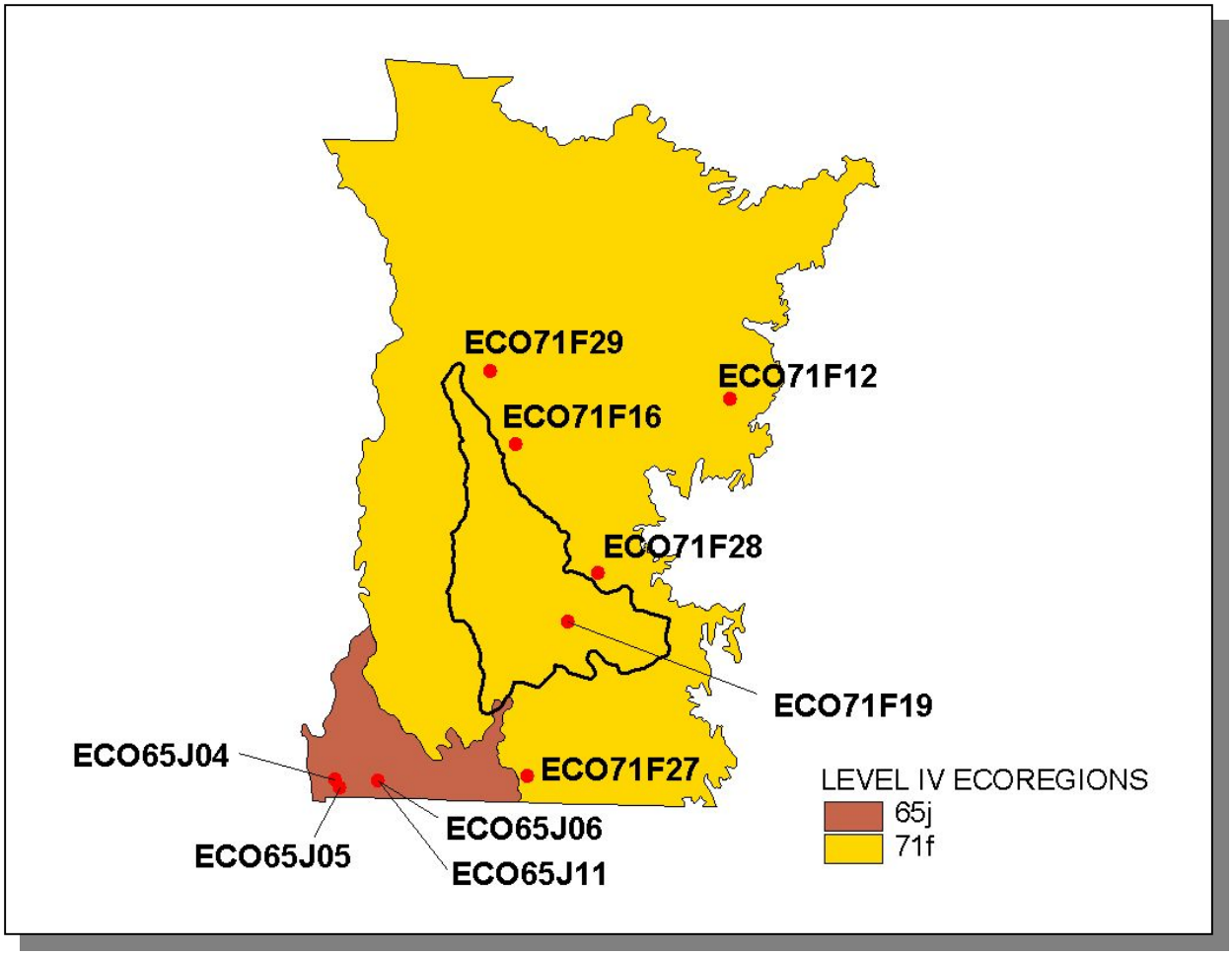


***Figure 2-10. Ecoregion Monitoring Sites in Level IV Ecoregions 65j and 71f in Tennessee.*** *The Buffalo River Watershed boundary is shown for reference. More information is provided in Appendix II.*

## 2.6. NATURAL RESOURCES.

2.6.A. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

| GROUPING | NUMBER OF RARE SPECIES |
|---|---|
| Crustaceans | 1 |
| Insects and Spiders | 3 |
| Mussels | 3 |
| Snails | 4 |
| Other Invertebrates | 1 |
| | |
| Amphibians | 1 |
| Birds | 3 |
| Fish | 11 |
| Mammals | 1 |
| Reptiles | 2 |
| | |
| Plants | 18 |
| | |
| **Total** | **48** |

***Table 2-3. There are 48 Known Rare Plant and Animal Species in the Buffalo River Watershed.***

In the Buffalo River Watershed, there are 12 rare fish species, 1 rare crustacean species, 3 rare mussel species, and 4 rare snail species.

| SCIENTIFIC NAME | COMMON NAME | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|
| *Ammocrypta vivax* | Scaly Sand Darter | | D |
| *Cyprinella monacha* | Spotfin Chub | LT | T |
| *Etheostoma aquali* | Coppercheek Darter | MC | T |
| *Etheostoma boschungi* | Slackwater Darter | LT | T |
| *Etheostoma cinereum* | Ashy Darter | MC | T |
| *Etheostoma denoncourti* | Golden Darter | | |
| *Etheostoma pseudovulatum* | Egg-Mimic Darter | MC | E |
| *Noturus sp 3* | Saddled Madtom | | T |
| *Percina burtoni* | Blotchside Darter | MC | D |
| *Percina macrocephala* | Longhead Darter | | T |
| *Typhlichthys subterraneus* | Southern Cavefish | MC | D |
| | | | |
| *Orconectes alabamensis* | A Crayfish | | D |
| | | | |
| *Hemistena lata* | Cracking Pearly Mussel | LE | E |
| *Quadrilla cylindrical cylindrical* | Rabbitsfoot | | |
| *Toxolasma cylindrellus* | Pale Lilliput | LE | E |
| | | | |
| *Leptoxis praerosa* | Onyx Rocksnail | | |
| *Lithasia duttoniana* | Helmet Rocksnail | | |
| *Lithasia geniculata fuliginosa* | Geniculate Rocksnail | | |
| *Lithasia geniculata fulginosa* | Geniculate Riversnail | | |

***Table 2-4. Rare Aquatic Species in the Buffalo River Watershed.*** *Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service; LT, Listed Threatened by the U.S. Fish and Wildlife Service; MC, Management Concern for U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; T, Listed Threatened by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at* http://www.state.tn.us/environment/nh/data.php.

2.6.B. Wetlands. The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

http://www.state.tn.us/environment/nh/wetlands/

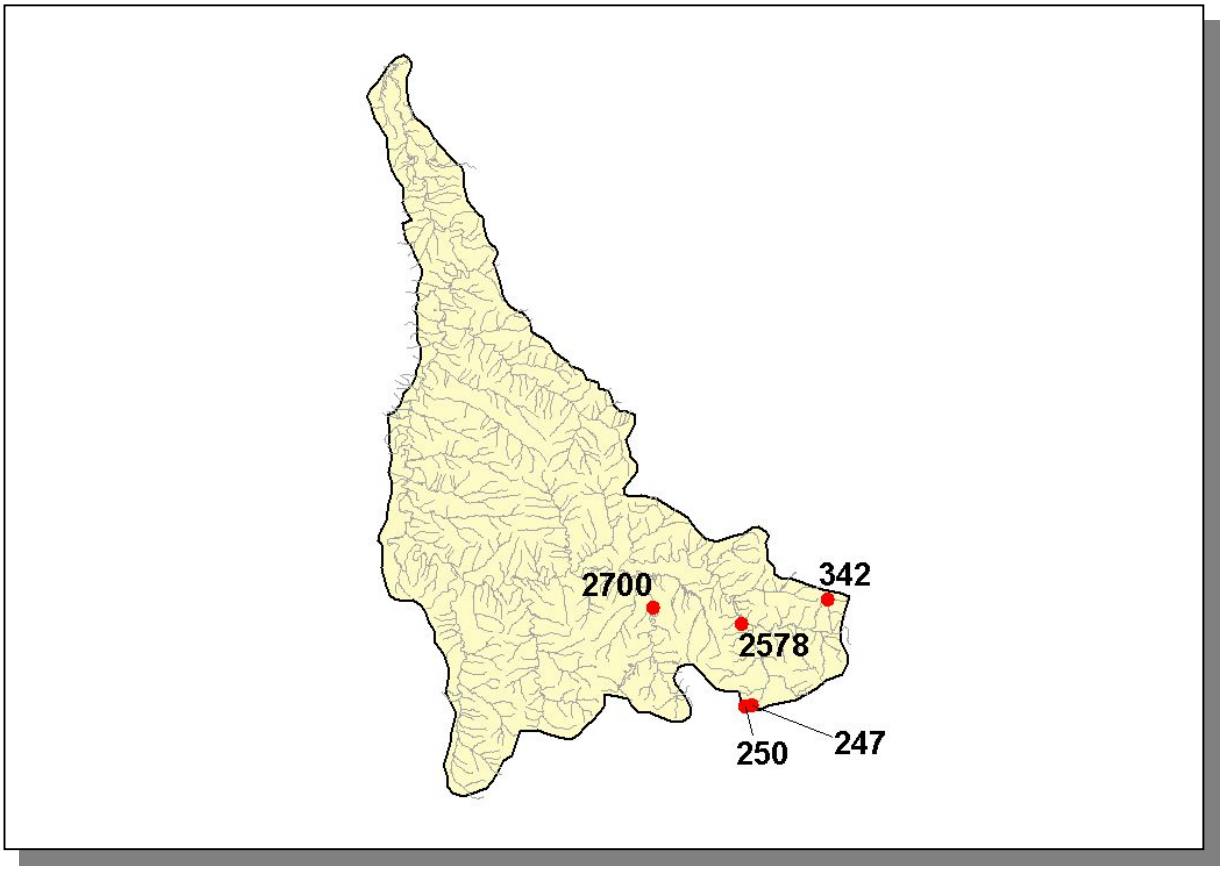


***Figure 2-11. Location of Wetland Sites in TDEC Division of Natural Heritage Database in the Buffalo River Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands****. More information is provided in Appendix II.*

## 2.7. CULTURAL RESOURCES.

2.7.A. State Scenic River. A portion of the Buffalo River has been designated as a State Scenic River. The entire river, except that portion which lies within Wayne, Perry, Humphreys and Lewis counties has been designated as a Class II Pastoral River Area. The Tennessee Scenic Rivers Act of 1968, as amended, defines Class II State Scenic Rivers as flowing through agricultural areas or lands used for dispersed human activities. More information about Tennessee's State Scenic River Program may be found at:

http://www.state.tn.us/environment/nh/scenicrivers/

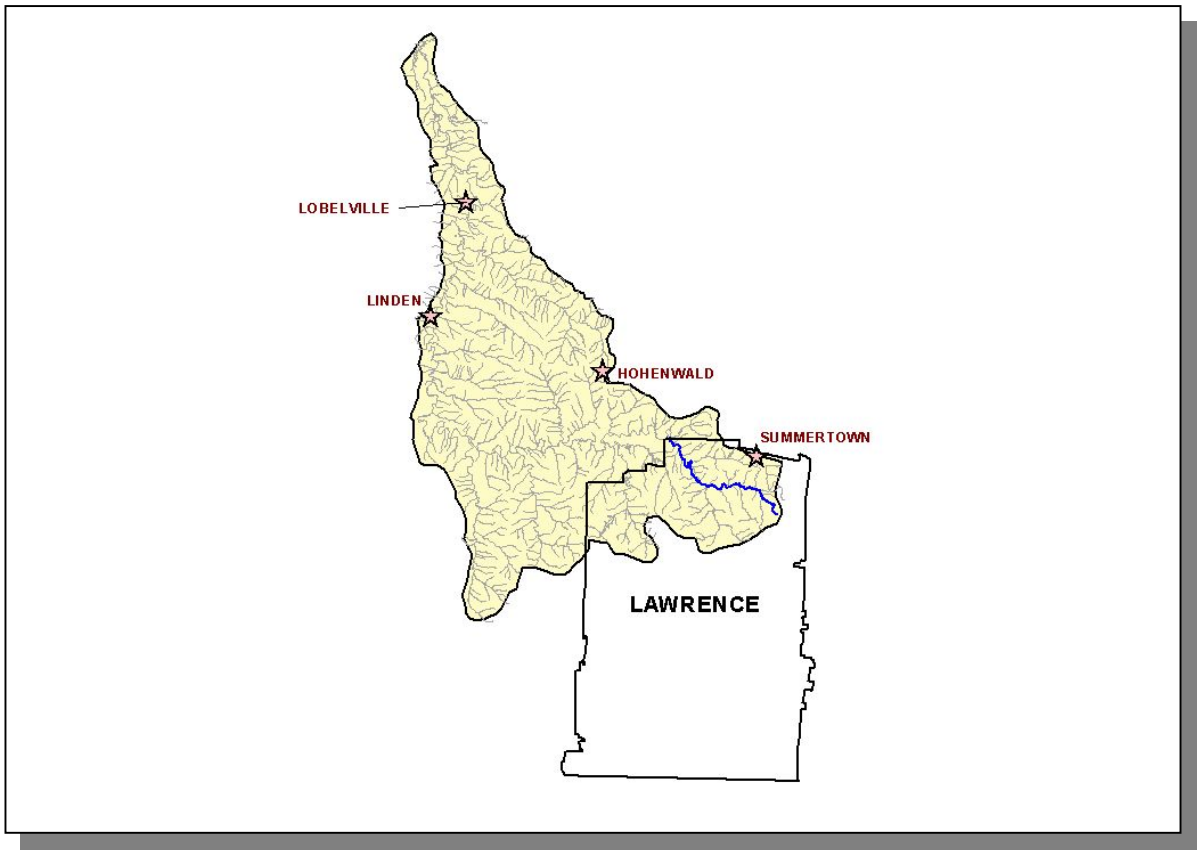


***Figure 2-12. A Portion of the Buffalo River is Designated as a State Scenic River.*** *Locations of Hohenwald, Linden, Lobelville, and Summertown are shown for reference.*

2.7.B. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of one stream in the Buffalo River Watershed:

Green River Creek, a scenic, rocky float stream.

| RIVER | SCENIC | RECREATION | GEOLOGIC | FISH | WILDLIFE |
|---|---|---|---|---|---|
| Green River | X | X | X | X | X |

***Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.***

Additional information may be found online at:

http://www.nps.gov/ncrc/programs/rtca/nri/states/tn.html

2.7.C. Greenways. The Buffalo River Watershed has at least two greenways/trails:

- City Park Walking Trail in Linden
- Lady's Bluff Trail in Perry County
- Buffalo River Trail in Perry County

More information about greenways and trails in the watershed may be found at:

http://www2.state.tn.us/tdec/GREENWAYS/tnmap.htm

2.7.D. Interpretive Areas. Some sites representative of the natural or cultural heritage are under state or federal protection:

- Lewis State Forest became a state forest in 1936 and features a demonstration forest road exemplifying the use of Best Management Practices. The primary recreational use of the 1,257-acre forest is hunting. The forest is managed by the Tennessee Department of Agriculture.

- Natchez Trace Parkway National Park commemorates an ancient trail that connected southern portions of the Mississippi River to salt licks in modern-day Tennessee. Between 1785 and 1820, boatmen floated down the Ohio and Mississippi Rivers to Natchez, MS and New Orleans, LA, and walked back to Nashville on the 444-mile Trace. The Parkway is managed by the National Park Service.

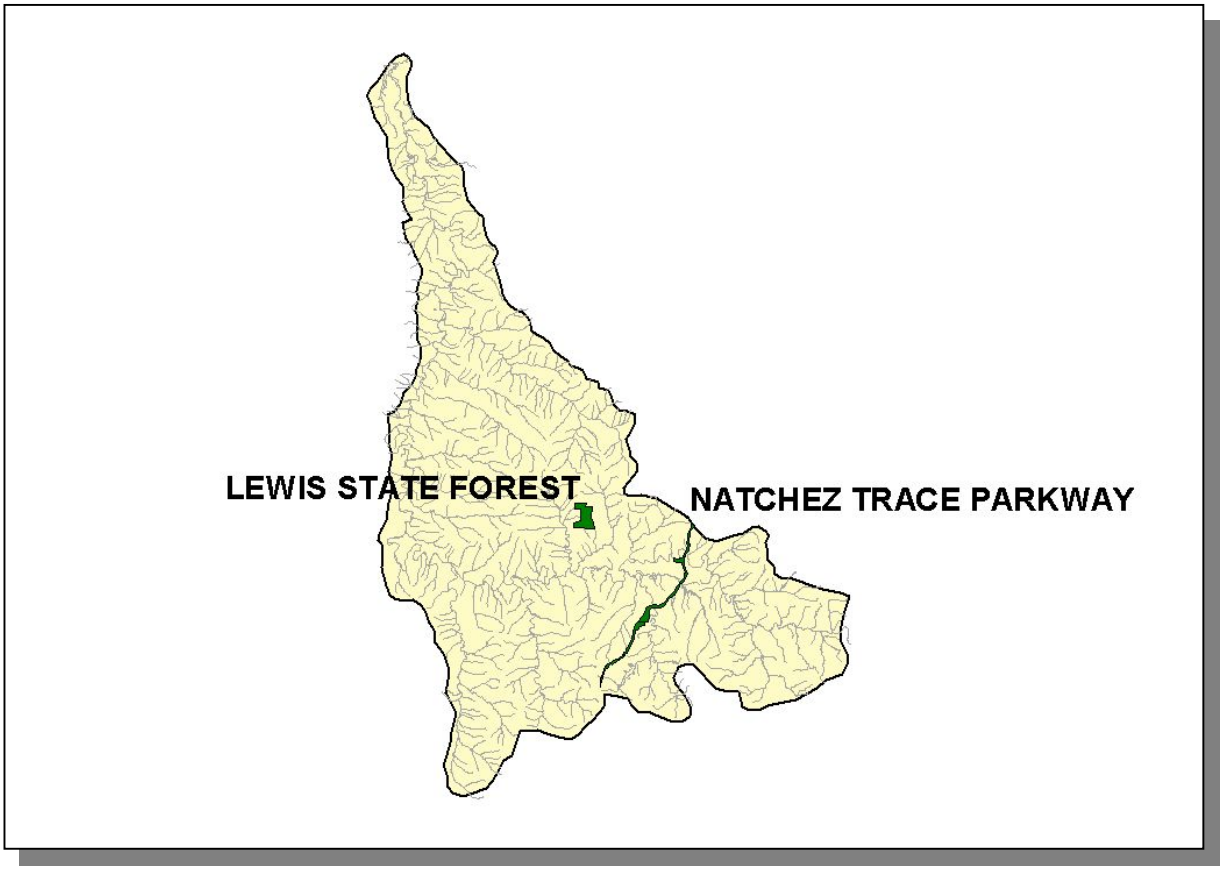


***Figure 2-13. Locations of State- and Federally-Managed Lands in the Buffalo River Watershed.***

2.7.E. Wildlife Management Area. The Tennessee Wildlife Resources Agency manages two wildlife management areas in the Buffalo River Watershed.

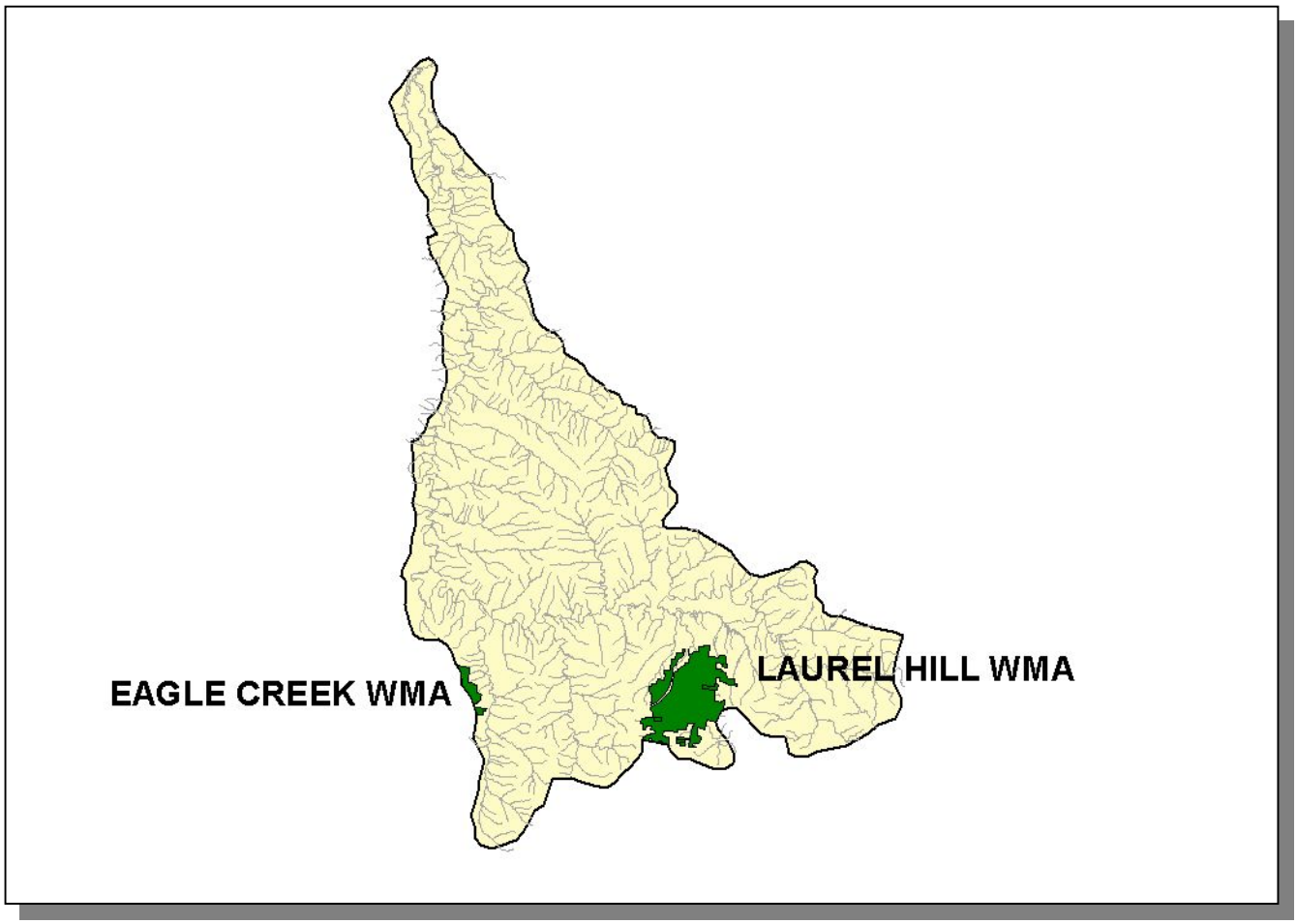


***Figure 2-14. TWRA Manages Wildlife Management Areas in the Buffalo River Watershed.***

**2.8. Tennessee Rivers Assessment Project.** The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

http://www.state.tn.us/environment/wpc/publications/riv/

| STREAM | NSQ | RB | RF | | STREAM | NSQ | RB | RF |
|---|---|---|---|---|---|---|---|---|
| Big Oppossum Creek | 2 | | | | Hurricane Creek | 1,2 | | 1 |
| Big Swan Creek | 2 | 2 | | | Little Buffalo River | 1 | 2 | 1 |
| Brush Creek (Chief Creek) | 2 | | 2 | | Peter Cove Creek | 2 | | |
| Brush Creek (Buffalo) | 2 | | 4 | | Pond Creek | | | 2 |
| Buffalo River | 1,2 | 1,2 | 2,3 | | Rockhouse Creek | 2 | | |
| Cane Creek | 2 | 2 | 1 | | Saw Creek | 4 | | |
| Chief Creek | 3 | | 1 | | Sinking Creek | 2 | | 1 |
| Coon Creek | 2 | | 2 | | Trace Creek | 2 | | |
| Fortyeight Creek | 2 | 3 | 2 | | Water Fork Creek | 3 | | |
| Green River | 2 | 2 | 3 | | West Fork Buffalo River | 3 | | |
| Grinders Creek | | 2 | 1 | | | | | |

***Table 2-6. Stream Scoring from the Tennessee Rivers Assessment Project in the Buffalo River Watershed.***

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed